REMARKS

Claims 1, 6-8, 10, 11 and 17 are pending.

Claims 1, 6-8, 10, 11 and 17 are rejected.

Claim status

As the Applicants believe the Examiner may be working with an incorrect version of the claims as they presently stand, the Applicants will give a short time line of the various amendments.

1.On May 18, 2004 the Examiner issued a Final Rejection.

2. The Applicants responded with an amendment after final on July 22, 2004.

3. In Office Action mailed on August 26, 2004, Examiner informed Applicants that the amended claims as submitted on July 22, 2005 raise the issue of new matter and therefore **would not be entered**.

4. The Applicants submitted a Notice of Appeal on September 20, 2004.

5. An Appeal Brief followed on December 16, 2005. The claims on appeal did not contain any of the amendments filed on July 22, 2005 **because the Examiner did not enter the amendments**. This of course, included correction of the spelling of "fertilizer".

6. On April 13, 2005, the Examiner withdrew the finality of the previous office action because a new rejection was made (US 5,482,529).

7. On July 13, 2005, the Applicants responded by amending the claims to correct the spelling of "fertilizer", and to adding matter from the disclosure to claims 1 and 7. **Support for these amendments were fully described in the reply sent on July 13, 2005. See page four of the reply sent on July 13, 2005.**

8. On November 3, 2005, Examiner responded by once again withdrawing the finality of the previous office action with another new rejection. The new rejection was made as an obviousness-type double patenting rejection over claims 1-18 of US 6,397,519.

The Applicants are responding to the November 3, 2005 rejections. The claim version the Applicants are using is the last version submitted on **July 13, 2005**. The Applicants have submitted a clean version so that there is no misunderstanding as to which version the Applicants are working with.

Amendments submitted and Explained on July 13, 2005

Fertilizer

Claims 1 and 8 were amended as suggested by the Examiner on July 13, 2005. "Fertiliser" has been changed to "fertilizer".

Support for Amendments

Claim 1 was further amended on July 13, 2005 to include the phrase:
wherein the aqueous soil treatment composition is suitable for being processed in dosing equipment which is in place for processing solutions of fertilizer alone and the aqueous soil treatment composition stabilizes and fertilizes the soil.

Support for this amendment was fully explained as below on July 13, 2005.

Support for this amendment may be found on page 3, lines 13-14
"thus we provide a single pack product which gives both fertilisation and soil stabilisation benefits."

and page 3, lines 22 to 25.
"Thus the viscosity of the fertiliser solution is not increased to an inconvenient degree and the aqueous composition of the invention can be processed using the equipment which is in place for processing of solution of fertiliser alone."

No new matter has been added.

Name Differences also Explained on July 13, 2005

Examiner notes a name difference in copending applications (09/361815 and 10/057,423). Simon Rose and Simon Alexander Hanson Rose are the same inventor. Jayne Turner and Jayne Anne Turner are the same inventor.

Double Patenting

Claims 1, 6-8, 10, 11 and 17 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-18 of US Patent No. 6,397,519.

The Examiner states that the claims although not identical are not patentable distinct because in present application component (a) is an ionic, water-soluble fertilizer wherein in US '519 component is a calcium compound.

The Applicants respectfully disagree with the Examiner's analysis;

The present claim 1 reads:

An aqueous soil treatment composition consisting essentially of water and, in solution,

(a) an ionic, water-soluble fertilizer in an amount of at least 10 wt.%, and

(b) a water-soluble anionic polymer which has intrinsic viscosity of from **9 to 12 dl/g** and is formed from water-soluble monomer **blend comprising 60 to 80 wt.% anionic monomer** and from **40 to 20 wt.% nonionic monomer**, the composition **having a viscosity of not more than 4,000 cps**, wherein the aqueous soil treatment composition is suitable for being processed in dosing equipment which is in place for processing solutions of fertilizer alone and the aqueous soil treatment composition stabilizes and fertilizes the soil.

Claim 1 of US '519 reads:

An aqueous soil treatment composition comprising water and,

(a) a calcium compound,

(b) a water-soluble anionic polymer which has intrinsic viscosity of less than 30 dl/g and is formed from water-soluble monomer of monomer blend **of which less than 40% by weight is anionic** monomer.

A simple display of the above claims with some of the differences highlighted shows that there is absolutely no overlap between claim 1 of US '519 and the present claim 1. Claim 1 of US '519 claims a soil treatment composition which comprises a calcium compound and a water-soluble anionic

polymer formed from **less than 40% by weight anionic monomer**. The present claim 1 comprises **comprising 60 to 80 wt.% anionic monomer.**

The limitations of claim 1 in US '519 (weight % of anionic monomer) and present claim 1 are mutually exclusive. There is no overlap between the two inventions. As a result, US '519 does not provide patent protection for the present invention. Thus no extension of patent term is at issue in the present case.

Furthermore, it is unreasonable to assume that US '519 which encompass water-soluble polymers formed from less than 40 wt. % anionic monomer could make water-soluble polymers formed from 60 to 80 wt. % anionic monomers (present invention) obvious, as the limitations are mutually exclusive.

Thus, the double patenting rejection has no basis in fact and is improper.

35 USC 103 (a)

Claims 1, 6-8, 10, 11 and 17 are rejected under 35 USC 103(a) as being unpatentable over Ahlnas et al, US 5,482,529.

Office states that the instant claims differ from this prior art in having a generic scope and one skilled in the art would be motivated to prepare the aqueous solution-form fertilizer as has been presently claimed because the prior art teaches the ranges in concentration and the amount of diluted fertilizer needed for soil aggregation. The Applicants respectfully disagree.

US '529 discloses aqueous fertilizer compositions in combination with 0.1-10 % by weight of an acid or its mixture, salt or anhydride. See examples of US '529.

US '529 discloses "the third embodiment of the acid is a polybasic carboxylic acid such as a polymeric carboxylic acid. Examples thereof include anionic polyelectrolytes, preferably polyacrylic acid, polymethacrylic acid and alpha-hydroxyacrylic acid. Good results have been accomplished with hydrolyzed polyacrylic amide." See column 2, lines 29-35 and example 16 in Table 3.

By contrast the instant claim 1 reads:

An aqueous soil treatment composition consisting essentially of water and, in solution,

(a) an ionic, water-soluble fertilizer in an amount of at least 10 wt.%, and

(b) a water-soluble anionic polymer which has intrinsic viscosity of from 9 to 12 dl/g and is formed from water-soluble monomer blend comprising 60 to 80 wt.% anionic monomer and from 40 to 20 wt.% nonionic monomer, the composition having a viscosity of not more than 4,000 cps, wherein the aqueous soil treatment composition is suitable for being processed in dosing equipment which is in place for processing solutions of fertilizer alone and the aqueous soil treatment composition stabilizes and fertilizes the soil.

US '529 makes no mention of:

1) composition consisting of water and, **in solution**
2) the viscosity of the anionic polymer,
3) percent anionic monomer making up the final polymer polymer,
4) percent of nonionic monomer making up the anionic polymer,
5) resulting viscosity of the final aqueous soil treatment.

Not one of these elements is discussed in US '529. In order for a 103(a) rejection to be proper all elements must be suggested or obvious to one skilled in the art. Since none of these elements are suggested in US '529, the Applicants assume the Examiner considers all 5 of these elements (1-5) obvious to one skilled in the art.

US '529 discloses pastes or emulsion-suspensions. The various examples of US '529 (examples 1-7, 9 and 20) refer to the composition as a "paste". The "paste" or emulsion-suspension is applied with a syringe. See column 3, lines 53-54 and example 8, line 55.

In contrast the instant invention is <u>in solution.</u> The solution consists essentially of fertilizer and water-soluble anionic polymer. The composition is suitable for dosing equipment in place for processing <u>solutions</u> of fertilizer alone.

Clearly US '529 does not disclose compositions <u>in solution.</u> Nor would it be obvious from US '529 to convert the pastes or emulsion-suspensions to solution compositions as these pastes or emulsion-suspension are applied using <u>spreading equipment of liquid manure which already exist in farms. See column 3, lines 54-57.</u>

US '529 also makes no mention of the other elements (2 thru 5 above) in claim 1. The applicants believe that it is unreasonable to assume that the specific limitations of the instant claim 1 could be arrived at by simple experimentation particularly since the motivation for a low viscosity solution is not present in US '529 as the compositions are spread not dosed as a solution as in instant. Thus Applicants believe the 103(a) rejection to be improper.

Claims 1, 6-8, 10, 11 and 17 are rejected under 35 U.S.C. § 103(a) as being unpatentable over EP 586,911 and Sylling et al WO85/01938.

Examiner alleges that the references teach polymeric soil improvement compositions, which embrace appellant's claimed invention. EP '911 teaches a composition for the treatment of soil containing an anionic fertilizer and an anionic polymer such as polyacrylamide and 97 to 0 mole percent of different water-soluble monomer or salts thereof. EP '911 teaches gel compositions and instant is aqueous composition. EP '911 does not specify viscosity, which is instantly claimed. WO '938 teaches a composition for desalination of soils comprising anionic polymeric materials such as copolymers of acrylic acid, and methacrylic acid in aqueous compositions.

The Applicants respectfully disagree with the Examiner's analysis for the following reasons:

A. The Applicants believe EP '911 does not discloses or suggest the instant aqueous soil treatment compositions with the claimed viscosity.

B. Applicants further aver that Sylling should not be used in combination with EP '911 as it deals with soil desalination not soil fertilization.

C. And finally, Applicants will point out that the instant compositions do show unobvious results (low viscosity) not suggested in EP '911 or Sylling.

A. The Applicants believe EP '911 does not discloses or suggest the instant aqueous soil treatment compositions with the claimed viscosity.

The instant claims teach a soil treatment process comprising adding an aqueous soil treament composition consisting essentially of:

a) an ionic water-soluble fertilizer in an amount of at least 10 weight percent, and

b) a water-soluble anionic polymer which has intrinsic viscosity of from 9 to 12 dl/g and is formed from water-soluble monomer blend comprising 60 to 80 wt. % anionc monomer and from 40 to 20 wt. % nonionic monomer, the composition having a viscosity of not more than 4,000 cps, to water, the composition being thereby diluted, and irrigating an area of soil with the water.

The present composition requires particular anionic water-soluble polymers as part of the aqueous composition. See polymer b) above. The Examiner states that the viscosity of the present anionic water-soluble polymers is the same as that taught by EP '911 even though there are absolutely no examples within EP '911 which encompass the anionic polymers of the present claims. See page 4 of Office Action mailed on May 20, 2004 wherein the Examiner states that "a chemical compound and its properties for example viscosity, melting point, density etc. are inseparable to the compound." Thus the Examiner makes the inherency argument that the anionic polymers and nutrients of EP '911 are the same as those described by the instant. As they are alleged to be the same, they must have the same intrinsic viscosity. The suggestion of Sylling to use aqueous compositions thus, according to the Examiner completes the limitations of the present claims.

EP '911 does show compositions for treatment of soil containing anionic fertilizers and anionic polymers. EP '911 gives a very generic description on page 3, lines 38-45 of copolymers of acrylamide and acrylic acid and suggests ranges of 3 to 100 mole percent of acrylic monomer unit or salts thereof and from about 97 to 0 mole percent of different water-soluble monomer or salts thereof. Examples of polymers useful in the practice of EP '911 are polyacrylamide, copolymers of acrylamide and acrylic acid, polyacrylates, modified cellulose polymers, polysaccharides etc. This generic disclosure covers almost an infinite number of polymers.

EP '911 examples 1-7 show specific polymers of acrylamide and acrylic acid (examples 1-4 and 7), sodium acrylate and 2-acrylamido-2-methylpropane sulfate (example 5) and carboxymethyl cellulose (example 6).

Examples 1-4 and 7 are the only copolymer compositions containing acrylic acid and acrylamide and each of these examples is made from a 90 % acrylamide to 10 % acrylic acid ratio.

There is not one example of Applicants specifically claimed water-soluble anionic polymer (60 to 80 wt. % anionic monomer and from 40 to 20 wt. % nonionic monomer) making up the water-soluble copolymer in combination with ionic fertilizers.

There is no mention in EP '911 of the intrinsic viscosity of the water-soluble anionic polymer, nor is there any mention of the viscosity of the polymer/fertilizer combinations in EP '911. And yet the Examiner alleges that the anionic polymers of EP '911 inherently have the same viscosity as the Applicants anionic polymers.

As stated in *Ex. parte Schricker*, 56 USPQ 2d 1723, 1725 (B.P.A.I. 2000) (unpublished)

[T]he examiner talks in terms of inherency (which is really an anticipation rationale) while on the other hand the examiner talks in terms that it would have been obvious to experiment to divine optimum conditions.

Inherency and obviousness are somewhat like oil and water--they do not mix well. Claimed subject matter can be anticipated because a prior art reference describes a method which inherently meets the limitations of a claimed method. Claimed subject matter can be unpatentable for obviousness when, notwithstanding a difference between that subject matter and a prior art reference, the claimed subject matter, as a whole, would have been obvious. However, when an examiner relies on inherency, it is incumbent on the examiner to point to the "page and line" of the prior art which justifies an inherency theory. *Compare In re Rijckaert*, 9 F.3d 1531, 1533, 28 USPQ 2d 1955, 1957 (Fed. Cir. 1993) (when the PTO asserts that there is an explicit or implicit teaching or suggestion in the prior art, it must indicate where such a teaching or suggestion appears in the prior art) (citing *In re Yates*, 663 F.2d 1054, 1057, 211 USPQ 1149, 1151 (C.C.P.A. 1981).

There is no suggestion in the cited prior art that justifies this inherency theory. There are no examples of polymers in EP '911 encompassed by the present claims. There is no discussion in EP '911 as to viscosity and the importance of this characteristic in regard to the compositions disclosed in EP'911. The Applicants aver it would not be obvious to select from the vast array of potential anionic polymers suggested by EP '911 and then from this vast array of potential anionic polymers to furthermore select the particular monomer ratio claimed by the instant invention with the claimed range of intrinsic viscosities (9 to 12 dl/g) and combine with nutrient to achieve a composition viscosity of not more than 4,000 cps.

B. Applicants further aver that Sylling should not be used in combination with EP '911 as it deals with soil desalination not soil fertilization.

Sylling et al. WO 85/01938 describes a soil treatment composition which is an aqueous solution comprising organophosphorus acids and an anionic water-soluble low molecular weight polymer (page 5, lines 3 to 7). The low molecular weight anionics of Sylling are used as dispersants to drive high sodium and alkaline ions away from growth sites or deslaination of soils. See page 5, paragraph

3. The anionic of Sylling are not used to stabilize the soil as in EP '911 and are "not intended as a means of introducing fertilizers to crops." See page 7 lines 18-21.

In contrast, the anionic polymers in the compositions of the instant invention have molecular weights sufficiently high to give a soil stabilization effect not a low molecular weight material which would act as a dispersant. See page 4, paragraph 4 of Applicants disclosure. In further contrast the present water-soluble anionic is formed from 60 to 80 % anionic monomer and from 40 to 20 wt. % nonionic. It is not clear from Sylling what wt. % of the Belcene is hydrolysed or anionic.

Thus, Sylling relates to a different technical area and does not constitute relevant prior art. A person skilled in the art would not look to Sylling for aqueous compositions including ionic fertilizer. As explained above the anionic of Sylling is "not intended as a means of introducing fertilizers to crops."

It is well-settled that the mere fact that the prior art could be modified to form the invention would not make that modification obvious unless the prior art suggested the desirability of the modification. In re Laskowski, 10 U.S.P.Q. 2d 1397, 1398 (Fed. Cir. 1989); In re Gordon, 733 F.2d 900, 902, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984). It is submitted that the cited art does not teach or suggest the desirability of modifying EP '911 to incorporate aqueous systems of Sylling as the compositions of Sylling are used for desalination of soil and definitely not suitable for fertilization and soil stabilization.

C. And finally, Applicants will point out that the instant compositions do show unobvious results (low viscosity) not suggested in EP '911 or Sylling.

For clarity, the Applicants state that the invention is: a concentrated composition, which contains polymer and at least 10 wt. % fertilizer, has an extraordinary low viscosity. Neither Sylling nor EP '911 recognizes the low viscosity advantages of the inventive compositions comprising high anionic content (60 to 80%) with high fertilizer content (at least 10%) as will be explained below.

Applicants point to polymer B as a representative example in their specification for the invention they are claiming. Polymer B is formed from 65 wt. % anionic monomer and 35 wt.% nonionic monomer (page 11, first two lines). In example 1 on page 10, compositions containing 2 wt. % of this polymer B and various fertilizers, namely urea ammonium nitrate (table 1, line 4, page 12), ammonium sulfate (table 1, line 7, page 12) and in example 2 on page 13, potassium chloride (table 2, line 5 and 6, page 14), show extremely low viscosities, namely 1510 cPs, 640 cPs, 350 and 375 cPs. In addition the

compositions containing polymer B, and various fertilizers still show excellent soil stabilizing characteristics as can be seen by the flocculation values, which are 216.3 (measured in turbidity NTU , table 1, line 4, page 12), 285.3 (table 1 line 7, page 12), 240 (table 2, line 5, page 14) and 148 (table 2, line 6, page 14) . These NTU respective values are 28.5, 37.6, 37.2 and 22.9 percent of the flocculation value of the control (no polymer).

Compositions containing 2 w% of a polymer having an anionic monomer content outside the range of 60 to 80 w% and various fertilizers all, despite two exceptions, show viscosities above 3500 cPs (tables 1 and 2). The exceptions are the compositions containing polymer E (table 1, line 9, page 12) and polymer H (table 2, line 7, page 14), which show viscosities of 90 and 1250 cPs, respectively. The composition containing polymer E, however, does not show any soil stabilizing effect.

Applicants point out that polymer A (14.6 wt. % sodium acrylate and 85.4 wt. % acryalmide I) in table 1, page 12 is highly viscous showing a cps of 11,030. Also the low anionic composition polymers in table 2 also show very high viscosities. See polymers containing 14.24 % and 14.6 % anionics, lines 4, 11 and 14 in table 2, page 14 respectively. Each of these show extremely high viscosities (12,500, 8,625 and V. Viscous respectively). The polymers disclosed in EP '911 made up of 10 % anionics are more likely to be closer to the viscosity of these low anionic % than to those claimed by the Applicants.

The fact that only soil treatment compositions containing at least 10 w% fertilizer and a polymer having an anionic monomer content of 60 to 80 w% and a nonionic monomer content of 20 to 40 w% show exceptional low viscosities is an unexpected result, which could not be predicted by a skilled person. Therefore the claimed invention is unobvious.

A 103(a) rejection requires that there must be some suggestion or motivation, either in the references themselves or in the art, to modify or combine teachings. Furthermore, once combined, the prior art references must teach all of the claim limitations.

There is no suggestion within EP'911 or Sylling to combine the teachings of each to achieve the instant invention. EP' 911 is directed to a chemical grouting which prevents erosion and Sylling is directed to a chemical composition used to desalinate soil, not useful for delivering soil nutrients. As EP '911 generic disclosure does not suggest selecting specific water-soluble anionics encompassed by the present invention (it would not have been obvious to experiment to divine

optimum conditions), the combination of EP '911 water-soluble anionics and ionic nutrients with Sylling would give an aqueous composition of polymers (10% anionic and 90/% nonionic) not encompassed by the present invention. As all the limitations are not taught by the prior art references when combined, the 103(a) rejection is improper and the Applicants request reconsideration and withdrawal.

It is submitted that neither EP '911 or Sylling singly or together:

1. Teaches the inventive low viscosity water-soluble anionic copolymer composition of the instant invention.

2. And finally the combining of the two references is improper because the compositions of Sylling are not suitable for fertilization.

3. Neither reference recognizes the unexpected exemplified viscosity advantages of the particular anionic composition of the present invention shown in tables I and 2 of the instant specification.

Thus the 103 (a) rejections of claims 1, 6- 8, 10, 11 and 17 based on EP '911 in view of Sylling are improper and Applicants aver that the rejection is addressed and successfully rebutted.

Claims 1, 6-8, 10, 11 and 17 are rejected under 35 USC 103(a) as being unpatentable over JP 51-124578.

JP 51-124578 discloses a soil treatment composition which is an aqueous solution comprising fertilizer and a water-soluble polymer consisting of 50 to 70 w% acrylamide and 30 to 50 w% potassium acrylate (page 2, third paragraph). This composition imparts to soil water-resistant aggregation ability and water-permeability as well as water retention property and is further useful as a fertilizer (page 1, third paragraph). It is usually diluted to a concentration of 1 to 10 w% fertilizer before being applied to the soil by appropriate methods such as spraying or dusting (page 3, second full paragraph). In example c) an aqueous solution comprising 11 w% fertilizer and 20 w% water-soluble polymer formed from 50 w% acrylamide and 50 w% acrylic acid is diluted by factor ten before being applied to sand soil.

The claimed composition differs from the composition disclosed in JP 51-124578 in that the instant contains a water-soluble polymer formed from 60 to 80 w% anionic monomer and 20 to 40 w% nonionic monomer. The advantage of this kind of polymer is discussed above (low viscosity when in a composition as in claim 1). The composition disclosed in JP 51-124578 can be diluted by water and then applied to the soil. However, it is not disclosed if this composition can also be added easily to irrigation water and thus is suitable for being processed using the dosing equipment which is in place for processing solutions of fertilizer alone. Based on the results presented in the present application the viscosity of the compositions disclosed in JP 51-124578 should be much higher than that of the claimed composition. Polymer L (42 anionic %) compositions show viscosities that vary from 5,975 and 6,150 cps in table 2. Polymer H (47 % anionic) shows some inconsistency from batch to batch. But clearly the compositions encompassed by the present invention, show dramatically lower viscosity than those encompassed by JP '578. Note that polymer B compositions show viscosities in the 300 cps ranges, as opposed to those compositions covered by JP '578 which show a cps that ranges from 1,250 to 9,000.

Therefore, as the inventive composition shows unexpected advantages (low viscosity with fertilizer) in light of tables 1 and 2 in the instant disclosure, the 103(a) rejection for JP '578 is addressed and successfully rebutted.

Examiners Response to Argument (page three of March 13th , 2005 Office Action)

The Examiner says that the Applicants' arguments that lowering the viscosity as unexpected results is not persuasive, as one skilled in the art would have been motivated to lower the viscosity, as lower viscosity fluids flow easier.

The Applicants agree that lower viscosity fluids flow easier. However, the Applicants believe that accomplishing this for a solution of fertilizer and soil stabilizer is unobvious in light of the art cited above.

US 5,482,529

The reference deals with pastes or emulsion-suspensions which are normally spread. See above in 103(a) argumentation. There is no motivation within US '529 to try and arrive at less viscous compositions and certainly no suggestion on how to accomplish this.

EP588 911

The reference contains no examples of polymers in EP '911 encompassed by the present claims. In fact, as stated by the Examiner, EP '911 teaches gel compositions. Applicants fail to see the motivation within EP '911 to arrive at the particular anionic content which would give the claimed viscosity limitations of the instant claim 1.

WO86/06714

As argued above is not properly combinable with EP '911 because the compositions of Sylling are not suitable for fertilization. See instant claim 1 which states that the aqueous soil treatment composition stabilizes and fertilizes the soil.

JP 51-124578

Based on the results presented in the present application the viscosity of the compositions disclosed in JP 51-124578 should be much higher than that of the claimed composition. See argumentation above. This reference does not suggest the means for arriving at the presently claimed viscosity.

Reconsideration and withdrawal of the rejection of claims 1,6-8, 10-11 and 17 is respectfully solicited in light of the remarks and amendments *supra*.

Since there are no other grounds of objection or rejection, passage of this application to issue with claims 1, 6- 8, 10, 11 and 17 is earnestly solicited.

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